The Veterinary Record.

(Founded by William Hunting, F.R.C.V.S., 1888.)

No. 27. JULY 7, 1928. Vol. 8.

Notes on Parasites in 1927.

By A. W. Noel Pillers.

The table which follows contains the names of some of the parasites which were examined during the year. To it have been added a few remarks upon species of special interest.

Name.	Host.	Locality.
Fungi :—		
Achorion sp.	Cat ...	Lancs.
? Protozoa :—		
Globidium smithi ...	Ox ...	Cornwall.
Cestoda :—		
Cysticercus pisiformis ...	Rabbit ...	London.
Cœnurus serialis ...	„ ...	Devon and Cornwall.
Tænia serrata	Dog ...	London.
Dipylidium caninum ...	Dog and Cat ...	London, Devon, Lancs.
Moniezia planissima ...	Ox ...	Cornwall.
Thysanosoma giordi ...	Ox ...	Sudan.
Anoplocephala mamillana	Horse ...	Lancs.
A. perfoliata	Horse and Ass	Cornwall and Sudan.
Trematoda :—		
Gastrodiscus ægyptiacus	Ox ...	Sudan.
Nematoda :—		
Ascaris lumbricoides ...	Pig ...	Lancs.
Ascaridia columbæ ...	Dove (*Phlogœnas rufescens*)	Lancs.
A. perspicillum	Fowl's egg ...	Somerset.
Porrocœcum decipiens ...	Dog, Halibut	Berks. and Yorks.
P. crassum	Duck ...	Northern Ireland.
Passalurus ambigua ...	Rabbit ...	London.
Oxyuris equi	Horse ...	Sudan.
Strongylus vulgaris ...	Horse ...	Yorks and Notts.
Trichonema longibursatum	Horse ...	Lancs.
T. minutum	„ ...	Ches.
T. labiatum	„ ...	„
Hæmonchus longistipes ...	Camel ...	Sudan.
Œsophagostomum radiatum	Ox ...	Cornwall.
Œ. columbianum ...	Sheep ...	Yorks and Lancs.
Bunostomum phlebotomum	Ox ...	Ches.
Parabronema africana ...	Elephant	Sudan.
Nematoda :—		
Setaria equina	Horse	Sudan.
Dipetalonema evansi ...	Camel ...	„
Aprocta sp.	Bustard (*Choriotis arabs*)	„
Oslerus osleri	Dog ...	Yorks.
Acarina :—		
Chorioptes equi	Horse ...	Carnarvon.
Demodex phylloides ...	Pig ...	Yorks.
Falculifer rostratus ...	Pigeon ...	Lancs.
Dermoglyphus sp. ...	Budgerijar	London.
Linguatulida :—		
Linguatula serrata ...	Dog ...	Ches.
Armillifer armillatus ...	Python ...	Sudan.
Insecta :—		
*Simulium ornatum** ...	Ox ...	Ches. and Denbigh.
Fannia canicularis ...	*Homo* ...	Westmorland
Eristalis tenax	„ ...	„
Œstrus ovis	Sheep ...	Yorks.
Gasterophilus equi ...	Horse ...	Ches.
G. nasalis...	„ ...	Bucks.
Palæopsylla minor† ...	Mole & Stoat	Ches.
Trichodectes dubius ...	Stoat ...	Ches.
Gliricola porcelli	Guinea-pig	Lancs.

* Kindly determined by Professor W. S. Patton.

† Kindly determined by Miss A. M. Evans.

? Protozoa. *Globidium smithi* was found in the small intestine of a bull in Cornwall. It is hoped that an account of this case may be published in due course.

Cestoda. Dried segments of *Dipylidium caninum* were again reported from the coat of the hind quarters of cats and dogs. A hackney yearling which had access to a box and field since birth was found to harbour several *Anoplocephala mamillana* in the small intestine, but no clue as to possible intermediate hosts was obtainable. In one case a horse in Cornwall was reported to have passed a complete *Anoplocephala perfoliata* in its fæces.

Trematoda. *Gastrodiscus ægyptiacus* was forwarded with a report that it had been taken from an ox in Sudan. This appears to be a new host.

Nematoda. Several deaths occurred in an aviary of valuable exotic doves—due to *Ascaridia columbæ*. *A. perspicillum* was found within a fowl's egg. (*Vide Vet. Record*, vol. vii., p. 323, 1927.)

Porrocœcum decipiens, a common nematode in the musculature of certain fish, was vomited by a dog. (*Vide Vet. Record*, vol. viii., 1928, p. 88.) A female *Strongylus*

vulgaris, 18 mm. in length, was found in an abscess of the near hind coronet of a horse. (*Vide* R. Hudson, F.R.C.V.S. *Vet. Journal*, vol. 33, N.S., 1927, p. 551.) A large number of *Trichonema longibursatum*, males and egg bearing females, were found in the small intestine, about twelve feet from the stomach, of a cart horse which was opened soon after death from twist of the double colon. *Oslerus osleri* was discovered in the trachea of a terrier on *post-mortem* in Yorks. It is hoped to publish particulars of such an interesting "find" in a short while.

ACARINA. *Falculifer rostratus* (the feather-perforating mite) was found damaging the wing primaries of pigeons in Lancs. (*Vide Vet. Journal*, vol. 83, 1927, p. 410.) An apparently new species of feather mite (*Dermoglyphus*) was reported from a cobalt budgerijar.

LINGUATULIDA. *Linguatula serrata* was stated to have been sneezed out of a dog's nose in Cheshire. There appears to be strong evidence that this parasite is markedly on the increase or a greater interest is being taken in it.

INSECTA. *Simulium ornatum* was found on two occasions to be attacking the teats of cows. (*Vide Vet. Record*, vol. vii., 1927, p. 529.) Larvæ of the lesser housefly, *Fannia canicularis* and the rat-tailed maggot, *Eristalis tenax*, were voided in the fæces of a human female in Westmorland. The eggs of *Gasterophilus nasalis* were found in the submaxillary space of a horse from Bucks, in September.

SPURIOUS PARASITES. In several cases vegetable hairs and fibres were mistaken for microscopic worms and in a few cases vegetable spores were thought to be eggs. Fæces from fleas often collect along the spinal region of the cat and dog. Such an accumulation is sometimes mistaken for ectozoa.

In one case a number of fowls were passing reddish coloured elongated bodies in the fæces and these were considered to be worms. On examination it was found that the bodies apparently resulted from an infection and consequent degeneration of the partly-developed eggs.

GENERAL. The examination of the fæces of animals for cestode, trematode, and nematode ova is being practised more often than formerly with increasingly satisfactory results. The same may be said with regard to skin scrapings, save perhaps that a warning note should be sounded in the case of *Demodex* in the dog. Here the lesion should be the guiding factor rather than the microscopical findings.

R.V.C. REBUILDING FUND: GARDEN FÊTE.

By the kindness of Miss B. M. Wills and Capt. J. R. Cleland (late R.F.A.) a Garden Fête was held on Wednesday, the 20th June, at "Moorcroft," Lidsing, Chatham, on behalf of the Rebuilding and Endowment Fund of the Royal Veterinary College.

The Fête, which was well attended, was formally opened by Mrs. D. F. Moir, of H.M. Dockyard, Sheerness. A varied programme of entertainments included a concert, whilst the ladies of the district, under the leadership of Mrs. Elmer Ebbetts and Mrs. Edwards, had organised stalls and other ingenious devices for withdrawing the money from the pockets of the country folk of that part of Kent into its ultimate resting place in Great College Street, Camden Town.

All present, including several visitors who had motored down from London, seemed to enjoy themselves, and the pecuniary sequel to the College fund was so very encouraging that, at the request of numerous friends, Miss Wills and Capt. Cleland very kindly promised to repeat the proceedings on an even larger scale before the summer was over.

The Tuberculosis Order, 1925.

MINISTRY OF AGRICULTURE AND THE COST OF ITS ADMINISTRATION.

At a recent meeting of the Executive Council of the County Councils Association, the (adopted) report of the Agricultural Committee stated that the Committee had "received" the following letter from the Ministry of Agriculture and Fisheries upon the subject of the cost of the administration of the Tuberculosis Order, 1925:—

"*24th November*, 1927.

"Sir,—I am directed to refer to the Ministry's letter of the 19th August last, and previous correspondence regarding the request of your Association for a grant from the Exchequer of 50 per cent. of the cost of the administration of the Tuberculosis Order of 1925, in addition to the grant now paid by the Ministry of 75 per cent. of the gross compensation, and I am to say that the further enquiries referred to in that letter have now been completed.

The Ministry desires me to express its thanks for the detailed information which accompanied your letter of the 10th May last as to the cost of the administration of the Order in various counties and to say that this information has been most helpful to the Ministry in conducting its further enquiries into the matter.

In the first place I am to observe that in the statement enclosed with your letter of the 10th May last, the total amount of compensation paid by the County Local Authorities mentioned amounted to £49,424, and the total of all other expenses paid by the Local Authorities amounted to £48,406. Thus the grand total of the amount paid by those Local Authorities was £97,830. Against this is to be set the amount received by the Local Authorities by way of contributions from the Exchequer in respect of compensation, namely £37,068, and the amount of the salvage proceeds, viz., £12,964, making a total received by Local Authorities of £50,032. It will, therefore, be seen that the amount received from the Ministry, together with the amount of the salvage receipts, was more than 50 per cent. of the gross expenditure of Local Authorities in connection with the Order, the amount of the Exchequer contribution alone constituting, as already mentioned in the Ministry's letter of the 19th August, 43.6 per cent. of the net expenditure, *i.e.*, after deducting the salvage receipts.

The request submitted to the Ministry in the Association's letter of the 10th May may be expressed as follows in terms of the figures given for the 51 counties:—

Gross compensation	...	£49,424
Gross administrative costs ...	...	£48,406
Total expenditure of Local Authorities...	...	£97,830

Receipts by Local Authorities on basis of Exchequer contributions in respect of—

(1) Three-fourths of gross compensation; and

(2) Fifty per cent. of other administrative costs would amount to:—

¾ of £49,424 = ...	...	£37,068
½ of £48,406 = ..	...	£24,203
Salvage receipts = ...	...	£12,964
Total receipts of Local Authorities	...	£74,235

This shows the Local Authorities would be recouped to the extent of 76 per cent. (approximately) of their gross expenditure, the Exchequer contribution amounting to £61,271, or 62 per cent. of the gross and 72 per cent. of the net expenditure.

Even if it were to be assumed that the maximum of economy has been reached in administering the Order, the Minister could not advise the Government to initiate fresh legislation with the object of increasing the Exchequer contributions in the manner proposed. The principle laid down with respect to diseases of animals generally in Sections 19 and 40 of the Diseases of Animals Act, 1894,

is that Local Authorities should bear the cost of measures necessary for their local administration. The Government recognised that an additional national factor entered into the question as it affects tuberculosis in cattle in view of its relationship with human tuberculosis, and on this account the Diseases of Animals Act, 1925, was passed to provide for an Exchequer contribution of 75 per cent. of the gross cost of compensation. It is considered that the proportion of the expenditure of Local Authorities which is at present being met by this Exchequer grant represents a fair and equitable apportionment of the liabilities as between national and local funds.

The Ministry does not, however, think that the Local Authorities have yet reached the position in which it may be said that the maximum of economy has been attained. It was evident from the information furnished by your Association that there was a wide variation in comparative administrative cost in different counties, and the purpose of the Ministry's enquiries has been to endeavour to discover the reasons for this variation.

It must not be forgotten that the Order did not come into operation until the 1st September, 1925, and that the figures submitted by your Association represent only the experience of the first complete year during which the Order operated. It will be readily appreciated that economy in administration can only be fully obtained in the light of experience, and that, therefore, the costs of administration which your Association has submitted are in all probability higher than they will be in subsequent years. From the commencement of the operation of the Order the Ministry's officers have been carefully observing the manner of its administration by Local Authorities, and in many instances have been able to point out where substantial economies could be effected. In certain instances the Ministry has arranged for one of its Superintending Inspectors to meet the Veterinary Inspectors of the Local Authorities to discuss fully the working of the Order, with, it is believed, very satisfactory results.

In the course of the recent enquiries it has been found that the principal reasons why the costs of administration are proportionately so much higher in certain counties than in others are as follows:—

(*a*) The extent of the use of the tuberculin test, which involves a number of visits by the Veterinary Inspector and is consequently a costly method of procedure.

(*b*) The fees and allowances paid for the professional work, the cumulative effect of which is obviously considerable.

(*c*) The extent to which inspections of contact animals are made with corresponding charges for fees and travelling expenses.

(*d*) The geographical difficulties in certain counties, which entail greater travelling expenses and also render the economical salvage of carcases difficult and in some cases impossible.

Whilst the difficulties referred to in (*d*) are recognised as being practically unavoidable, the Ministry is of opinion that as a result of experience and consultation the administrative costs of the Order generally should fall considerably. Indeed, there is already a tendency in this direction. For instance, in one county the Ministry is informed that it is estimated that in the coming year, by the reduction of fees, a saving of £300 will be effected.

In order that individual Local Authorities may be placed in a position to utilise the results of the general experience gained, and of the enquiries which have elicited the particular lines along which greater economy in some districts might possibly be effected, the Ministry will be very pleased to afford assistance in this matter to any Local Authorities who may desire it, and with this object to send one of its senior Inspectors to confer with them or any of their officers.

(Signed) CHARLES J. H. THOMAS.

The Secretary,
County Councils Association."

Report on the Elimination from a Dairy Herd of Cows Reacting to the Tuberculin Test.*

By D. R. EDWARDES-KER, O.B.E., M.A. (Oxon.).

The particulars given in the following report of the intradermal tuberculin reactions, slaughter and subsequent *post-mortem* examinations of a number of cows in a certain herd in which careful records were kept previous to and during the process of clearance may prove of interest and worth recording for the following reasons:—

(*a*) The national importance of production of clean milk from non-reacting cows.
(*b*) The employment in the case in question of the new double intradermal and ophthalmic test.
(*c*) The large proportion of reacting animals.
(*d*) The rapidity with which all reacting animals were disposed of by slaughter.
(*e*) The *post-mortem* examination of all carcases both by a Veterinary Surgeon and a Sanitary Inspector.

The animals had mainly been bred on the farm in question from pedigree cows. A note of animals purchased is made against the various names in the table accompanying this report.

For two and a half years previous to the application of the tuberculin test, Grade A milk had been produced from the herd, which had therefore been subjected to a quarterly examination by a veterinary surgeon. This point is of interest in view of the fact that in spite of this regular examination a large proportion of the animals were subsequently found to be reactors. During the three years previous to the test, there had been a systematic weeding out of any "bad doers" or poor milk yielders or animals otherwise unsatisfactory for any particular reason. As a result of this, the animals at the time of testing were without exception of unusually sound appearance and in very good condition, the herd as a whole giving every appearance of an entire absence of anything amiss. It was not expected that there would be any reactors in the herd, there being no appearance of tuberculosis in any of the animals. In justice to the veterinary surgeon, it is wished to stress this sound appearance of all the animals, and the absence of any indication of tuberculosis.

The "shippons" in which the animals were housed for three years previous to the test were of up-to-date construction, with tubular fittings, concrete floors, ample air space and ventilation, and with a four foot feeding passage in front of each row of cows, which faced outwards. The cows generally occupied the cowshed only for milking purposes twice daily, excepting for the winter periods when they generally slept in. For the first time they were kept in for a continuous period of three months during the winter preceding the tuberculin test on account of inclement weather. It is not impossible that during this period of confinement an (unsuspected) tuberculous animal may have infected the majority of the herd. One cow (Ford) housed separately in a loose box throughout this winter period nevertheless was found to be similarly affected to the other reactors.

The first application of the double intradermal and ophthalmic tuberculin test was made in July, 1926. As a

*Seale-Hayne Agricultural College, Newton Abbot. Pamphlet No. 29 March, 1928.

Animal's Name	Bred or Purchased	Age yrs.	Tuberculin reaction	Estimated value before slaughter	Amount received from butcher	Loss	Reaction to Tuberculin Test (negligible, slight, marked, or serious).	Result of P.M. and locations of tuberculous lesions.
Heifer	Bred	3	Passed	£30			negligible	
Pimpernel ...	Purchased	9	„	£35				
Foreman ...	„	7	„	£35				
Duchess... ...	„	8	„	£38				
Ferry Dolly ...	„	4	„	£32				
Snowdrop ...	„	9	„	£26				
Crocus	Purchased	4	Failed	£25	£20	£5	marked	Tuberculous lungs
Wills II. ...	Bred	5	„	£32	£64 (4 animals	£62	slight	Free from tuberculosis (offal not examined by Vet. Surgeon)
Tiny	„	7	„	£30			marked	Lung glands much enlarged & broken down
Parkhill Princess	Purchased	7	„	£36			serious	Lung glands slightly affected
Alice	Bred	5	„	£28			serious	Lung tissue & glands, also bowel glands
Vinnie	„	6	„	£30	£120 (9 animals)	£173	slight	Lung glands (slightly)
Marjorie ...	„	6	„	£34			slight	Glands of lungs & head
Lemen	Purchased	6	„	£36			slight	Lung glands (slightly)
Iris	Bred	6	„	£24			serious	Lung tissue & glands very bad
Mann	Purchased	7	„	£34			marked	Lung glands
Cowslip	Bred	6	„	£35			slight	Lung tissue and glands
Fillpail ...	Purchased	5	„	£32			slight	A minute tuberculous nodule in one of the bowel glands
Peeke	„	6	„	£24			marked	Glands of lungs and bowels
Handsome ...	„	7	„	£44			slight	Lungs (tissue & glands) very bad. Liver gland also affected.
Ann	Bred	7	„	£23	£1	£22	marked	Very bad case. All organs, including udder and womb affected. Chest and abdominal walls covered with tuberculous lesions. Carcase condemned.
Pixie	Purchased	6	„	£25	£1	£24	marked	Udder very bad, as regards supramammary lymphatic glands
Laurie	„	7	„	£30	£1	£29	marked	Carcase condemned. The parts affected were: Carcase glands, lungs and liver (badly) spleen and bowel glands
Wills I. ...	„	5	„	£38			slight	One lung gland
Primrose ...	„	8	„	£30			slight	Very small nodule in one of the bowel glands. Query if tuberculous

Animal's Name	Bred or Purchased	Age yrs.	Tuberculin reaction	Estimated value before slaughter	Amount received from butcher	Loss	Reaction to Tuberculin Test (negligible, slight, marked, or serious).	Result of P.M. and locations of tuberculous lesions.
Victoria... ...	Purchased	8	Failed	£30	£88 (10 animals)	£257	slight	Very small nodule in one of the bowel glands. Query if tuberculous
Violet	„	9	„	£30			marked	Tissue & glands of lungs
Ford	„	6	„	£45			slight	Head & lung glands
Sherford Dolly...	„	8	„	£32			slight	Tissue & glands of lungs & bowel glands
Pansy	Bred	6	„	£28			marked	Lung tissue & glands rather bad. Head & bowel glands also involved
Turner I. ...	Purchased	7	„	£42			serious	Large tuberculous lesions on the chest side of the diaphragm. Neck glands involved in the disease. Also lung glands and one bowel gland. Forequarters condemned
Turner II. ...	„	6	„	£40			marked	Lung & bowel glands
Annie	Bred	5	„	£30			marked	Lung tissue & glands

TOTAL LOSS £572.

result of what appeared to be an abnormally large number of reactors (80 %), the efficacy of the test was in certain cases doubted, and the swelling in such cases was for the time being attributed to irritation caused by the metal stanchions rubbing the point of injection on the neck.

A second complete test was therefore carried out in September, the point of injection being further back on the neck so as to be out of contact with the stanchions. Of 33 cows so tested, 27 were classified as reactors. Owing to this high figure in a herd of animals in exceptionally good condition and showing no sign of tuberculosis in any form, one cow (Crocus) showing an average reaction (swelling from 6½ mm.: through 23 mm.: at 48th hour to 50 mm. after 72 hours) was selected, slaughtered, and a careful *post-mortem* made. Distinct tuberculous lesions in the lungs were found, and as a result of this finding, all the remaining reactors were then slaughtered in succession within a period of four weeks, *post-mortems* being carried out in every case with results as noted in the table.

Each of the 27 slaughtered animals was submitted to a careful *post-mortem* examination by a veterinary surgeon and a sanitary inspector independently. In every case with one exception, distinct evidence of tuberculosis was found, often to a slight extent, but invariably present. Certain of the animals were in an advanced stage of the disease, and two were found to be affected in the glands of the udder. There appeared to be no exact relation between the amount of swelling given by the tuberculin test and the degree of tuberculosis subsequently found.

There is little doubt, in the writer's opinion, that the one reacting animal which on the most careful search showed no trace of tuberculosis was nevertheless affected, in view of the fact that certain other affected animals had to be submitted to a most thorough examination before the tuberculous lesions could be found, so small was the amount of the disease. The intradermal and ophthalmic test thus appears to be a very searching means of detection of tuberculosis, a positive reaction being obtained even in the case of animals only slightly affected.

It is of great interest to note that immediately the cows were proved to contain a high proportion of reactors, a sample of mixed milk of the whole herd was taken on October 9th, and sent to the National Institute for Research in Dairying. Both by the acid fast test and the animal inoculation test this sample was reported free from tubercle, although, as was subsequently found, two of the cows were badly affected in the udder (supramammary lymphatic glands).

In order to estimate the financial loss caused by the forced slaughter of animals well on in calf and in milk, as most of them were, an estimated figure of the value of each animal as a milking cow is given, based on market values ruling at the time. The sum actually received from the butcher is also given in each case, and it is found that a loss of £572 was sustained by the slaughtering of the 27 animals.

In the table the result of the sanitary inspector's examination on each carcase is given in detail. The veterinary surgeon also made *post-mortem* examinations

in all cases, but in the case of Wills II. the offal was not available for his inspection.

General Conclusions.

1. Repeated clinical examination by a veterinary surgeon may give no indication of tuberculosis even if advanced.

2. The new double intradermal test is confirmed, in that of 27 reactors all excepting one showed undoubted tuberculosis on slaughter.

3. Reactors to the tuberculin test may give milk entirely free from tubercle, even with tuberculosis of the udder glands, provided that the actual milk-producing glands are not affected.

4. The continued housing of cows even in well ventilated cowsheds may possibly lead to one animal infecting a whole herd.

5. Producers of Grade A milk (which requires no tuberculin test) who are desirous of producing Certified or Grade A (Tuberculin tested) milk would be well advised, in view of the possibility of a large number of reactors similar to the case reported above, to arrange for the tuberculin test to be applied to one or two animals only at a time, as subsequent reactors may not be used for the production even of Grade A milk. In this way some indication as to the number of likely reactors may be gained, and the testing arranged accordingly, so as not to jeopardise the production of Grade A milk pending the elimination of reactors. Although Grade A milk production does not require the tuberculin test, if this test is applied milk from reactors may not be sold as Grade A.

6. The slaughter of cows reacting to the tuberculin test is not compulsory and does not come under the Tuberculosis Order. There is, therefore, no compensation obtainable by a producer of Certified or Grade A (T.T.) milk to recoup him for the loss he sustains on his reactors which must show a loss on disposal, whether sold or used for suckling and then fattened off.

It should, of course, be noted that the considerable loss of £572 on a herd of 33 cows is an exceptional case, as for special reasons all reactors were slaughtered, which is not ordinarily necessary. A loss of £5 to £10 per reacting cow would, however, apply in any normal case.

7. The drastic and costly slaughter mentioned above has been justified by no recurrence of tuberculosis in two subsequent six-monthly tests.

Adulteration of Milk.—In the House of Commons recently, Sir Kingsley Wood, in reply to Sir Walter de Frece, said that official statistics indicated a progressive decrease in the adulteration of milk, the percentage of samples reported by public analysts as adulterated or below the presumptive standards being 6.9 in 1927, as compared with 7.4 in 1926, and 9.3 in 1920. There was no specific requirement as to the number of samples to be taken annually by a local authority, but it was the practice of the Ministry of Health to communicate from time to time with those authorities which did not seem to be taking a sufficient number to provide a proper check on adulteration.

The Production of Grade A (T.T.) Milk.

Veterinarians at Opening of New Tamworth Dairies.

In order to deal more adequately with Grade A (T.T.) milk, in which they are specialising, and for which there is a growing demand, the Tamworth Industrial Co-operative Society, Ltd., have built new dairies in Marmion Street, Tamworth, and the opening ceremony, which took place on the afternoon of June 20th, was an interesting function. It was attended by well-known figures in veterinary and agricultural spheres, including Colonel J. W. Brittlebank, President of the Royal College of Veterinary Surgeons, Mr. H. W. Steele Bodger (Veterinary Surgeon to the Society) and Professor R. Stenhouse Williams of the National Institute of Research in Dairying, Reading.

In declaring the dairies open, Professor Stenhouse Williams said it was a very great pleasure to some of them who had been working for the improvement of the milk supply of the country for a number of years to come there that day and tell them that until a few years ago there was only one solitary farmer in this country producing milk of the highest type—fresh, clean milk from cows which would not give rise to tuberculosis—and it was not at all clear that the public would buy his milk from him when he had produced it. And here to-day, within so short a time, they had that dairy and those pioneers who were at the back of it offering the citizens of Tamworth the best that they could obtain for the good of the babies and the children of the future of that great and wonderful nation to which they all belonged. There was no greater service that any man could render this country than to see to it that the children of our generation should be the finest the world produced. He was sure it must be a joy to them to think that their milk supply was such that they could take it without fear always. He had therefore the greatest pleasure in declaring the dairy open, and he thought they would wish him to express to those who had started that work the gratitude of the people of the town for their efforts to do their best for their country.

Public Health Development.

Lieut.-Colonel Brittlebank, referring to earlier work to produce clean milk, said one was gratified to know to-day that England was progressing. In the past it had been almost too much to bear to hear the United States everlastingly thrown at one as the only country where they could do things properly. He had always had great faith in our own country and said when England really took hold of that problem she would make the rest of the world sit up. He believed the time was coming very fast. The public conscience was being awakened. The public health development of the last twenty years had been something enormous, and when the public realised the huge possibilities, the huge importance and close relationship there was between animal and human diseases, the step would be properly taken to deal not only with the problem of the milk supply, but also with other problems which were allied with it. Agriculture itself, he had no doubt, realised fully the enormous losses which it suffered from tuberculosis, but unfortunately had to realise that it was in a very difficult position to help itself. But there was much that even agriculture could do without any serious ex-

penditure of money which he thought it ought to proceed to do. It could proceed to eliminate the gross infection in its cow houses, which would make very material progress against that insidious and awful disease. It had been said that what they had done that day, an achievement in obtaining a raw, clean, disease-free milk, was only possible for small centres, which was probably true, but he believed the day would come when throughout the country all their centres, big cities, would require the same precautions to be taken with their milk supply as they were very wisely taking in Tamworth. Where there was dirt they might be sure there was disease, the two went side by side. A striking factor in that great work was when that specially controlled milk had been made available the first people to demand it had been the very poor. And why? Because they could not afford to be ill. Their financial position was such that those mothers—and wonderful mothers they were—must take every possible precaution with their children to ensure that there should be no greater strain on the family resources than was absolutely necessary. In that work at Tamworth, he was very glad to know as the president of his profession, that they had had the great assistance of Mr. Steele Bodger whom he had known for a good many years and of whom he was proud. Mr. Steele Bodger was possessed with exceptional enthusiasm and optimism, which were so essential in work of that sort, and he hoped that having put his shoulder to the wheel in that district, they would help him to keep that wheel turning in no uncertain manner. He hoped the dairy would succeed and that Tamworth and district would shortly realise the enormous benefit conferred upon the population by the efforts put forward by the Society.

In calling upon Mr. Steele Bodger to speak, the Chairman of the Society (Mr. W. J. French) said the Committee of the Society realised the valuable work that has been done by him, and not one of them would begrudge him all the credit he was entitled to for the position in which they found themselves regarding the dairy.

Mr. STEELE BODGER said the Mayor had alluded to bottled milk and wrapped bread and a gentleman said to him that day "I hope you are satisfied now." He was not. There was one other thing which he would like to see, and he hoped the time was not very far off, that being a public slaughterhouse in the district, for he was convinced that only by a public slaughterhouse could they ensure the same purity of meat supply as they had now for their milk and bread supplies. To the best of his knowledge the Midland Counties Dairies were the only milk people in the British Isles who paid for their milk on a quality basis. They paid their producers 1d. per gallon extra for the twelve cleanest milks and ½d. per gallon on the next twenty-four, which had resulted in the supply of milk from that district having been absolutely changed, and he thought he was not far wrong in saying that of his 140 producers, the dirtiest milk he received to-day was cleaner than the cleanest milk he received five years ago. It was the aim of farmers and dairymen to produce raw milk sufficiently pure to be drunk without any nervousness at all by the public at large. He was convinced that the milk of the future was not pasteurised milk, but grade A (T.T.) milk. He had heard it said good milk did not require pasteurisation and bad milk did not deserve it; he agreed with that.

World's Dairy Congress.

SESSIONS IN LONDON.

We hope to publish, in due course, a full account of that portion of the proceedings of particular interest to the veterinarian in connection with the Eighth World's Dairy Congress, which opened in London on June 27th, and which will continue until July 12th.

Mr. Walter Guinness, Minister of Agriculture, who, with Mr. Chamberlain, Minister of Health, and Sir John Gilmour, Secretary of State for Scotland, is an hon. joint president of the Congress, welcomed the 2,000 delegates at the opening session which was held at the Central Hall, Westminster. He said that it was not surprising that they had to deal with problems of great complexity, considering the importance and size of the industry. Dairy farming was probably the earliest branch of agriculture. In the last 100 years there had been a most astounding development, largely because of the advance in the system of transport.

The dairy industry in this country had become the greatest single branch of our agriculture. The value of the dairy products in England and Wales was about £58,000,000 a year. It amounted to one-quarter of our total agricultural output and the dairy herds were showing a continual increase. Much had been done by research and education to improve standards and to deserve public confidence, but much still remained to be done.

There was room for the great development of raw milk production in this country, for there were few great countries where the consumption of milk per head was so low as here. They could claim that in matters of cleanliness and quality our milk, though still imperfect, was second to none in the world. He added that, although the delegates to the Congress were competitors in the markets of the world, they were co-operators in education and research. That meeting showed that to be the case, and it would no doubt prove of value to the whole world.

On June 29th, Lieut.-Colonel Brittlebank, President of the Royal College of Veterinary Surgeons, presided over a special section which discussed "The Veterinarian in Relation to the Milk Supply." He said he believed the Government was fully alive to the importance of research into animal diseases. No public health service was properly equipped that did not include a well-trained veterinary officer in its *personnel*. Every up-to-date medical officer of health had realised that he could not do without a trained specialist in animal diseases, whether for the control of meat or the milk supplies. In a more general employment of the veterinarian lay the true solution of the control of disease communicable from animal to man, and, *inter alia* the general cleaning up of our animal food supplies.

The opening paper was presented by Capt. A. W. Noel Pillers, F.R.C.V.S., D.V.S.M., Deputy Chief Veterinary Officer, City of Liverpool.

At a later session Col. Brittlebank presided over a meeting to discuss the inspection of dairy cows and the need for a state veterinary health service, when Mr. Trevor F. Spencer, M.R.C.V.S., Kettering, in his opening paper, said he agreed with those who believed that what they understood as the milk problem depended entirely for a solution on the possibility of eradicating bovine tuberculosis from the dairy herds. Up to the present, all their milk laws had been tentative and vacillating, and even that which was at present operative (The Consolidation Act of 1915), also the Milk and Dairies Order, 1926, made under it, bore the imprint of mere expediency. In short, they seemed willing to wound but afraid to strike at the fundamental reasons for the existence of a milk problem, which, however, would remain unsolved just so long as this attitude continued.

Edinburgh College Prize Distribution.

COMMEMORATION WINDOW UNVEILED.

An interesting feature of the proceedings on the occasion of the annual distribution of prizes at the Royal (Dick) Veterinary College, Edinburgh, on June 27th, was the unveiling by Viscount Novar of a commemoration window

subscribed to by past and present pupils who have studied in the present College buildings. Some time ago, the larger lights in the windows of the entrance hall were filled with stained glass by those who had been students in the old buildings in Clyde Street. The windows, as now completed, therefore, are commemorative of the connection of all students from the time of the foundation of the College to the present day, and it may be claimed that every part of the Empire is represented in them. The middle light of the three contains the College arms, and the side lights have panels of a symbolic nature:—the thistle in one, and the flowering aloe in the other.

Mr. K. W. Harcourt, President of the Students' Representative Council, asked the Board of Governors to accept the custody of the window as a mark of their appreciation, loyalty, and good wishes. He said it would contribute to the beauty and embellishment of the College, as well as serve as a reminder of those who had passed that way.

Sir Thomas Hudson Beare, chairman of the Board of Management, who presided, said he accepted the custody of the window with gratitude, and the Governors would value it as a memento of the spirit they desired to cultivate in the College.

Concerning the work of the College, the Chairman said they could safely say that that had been a successful session. Their numbers had kept up, and he was particularly glad to find that the number of post-graduate students remained large. That was a branch of the work they were hoping to develop more and more each year. The number of appointments obtained by old students had been satisfactory. One of the most pressing needs of the College was more money. The Board of Management would be delighted if they could strengthen their teaching staff both in numbers and new lines of work. Unfortunately they were largely dependent on the grants they received from the Exchequer, and in these days there was not much chance of the grants being increased, therefore the College had to rely on the generosity of private donors. Private donors were often attracted by research work. He considered that it would be a terrible calamity if research was divorced from teaching. They wanted their young men to be taught their future profession in an atmosphere where they saw research work going on.

The Principal of the College, Dr. O. Charnock Bradley, in introducing the prize winners, said that at that College, at any rate, the teachers were fully alive to their duty in the direction of research. They were fully alive to the fact that they must stimulate and foster the spirit of research in students. He believed the young human animal was born with the spirit of research, and broken toys were very often the outward evidence of that spirit. (Laughter and applause.) Among other work that had been going on, two of his colleagues had for some little time been seeking to discover the true inward cause of milk fever.

Viscount Novar then distributed the prizes, advising the students to devote themselves to their profession, and to gain the confidence of the stockowners. If they did so, there was a wonderful field for them, because here in Great Britain they had the finest stock in the world.

The prize-list was as follows:—

	Silver Medal.	Bronze Medal.
Junior Anatomy ...	W. F. Barton.	W. G. Edwards.
Practical Anatomy ...	W. G. Edwards.	—
Biology ...	H. McVean.	J. D. Daly.
Chemistry ...	W. F. Barton.	A. M. Adamson.
Practical Chemistry ...	—	A. Thomson.
Senior Anatomy ...	J. Omand.	W. G. Robinson.
Practical Anatomy ...	L. Sahai, M.Sc.	—
Histology	—	A. E. Stevenson.
Physiology	L. Sahai, M.Sc.	J. Omand.
Practical Physiology...	—	R. S. Cockburn.
Zootechny	J. E. C. Stuart.	R. H. Robertson.
Materia Medica ...	J. B. McKinna.	A. P. Steele, B.Sc.
Patholoy	A. P. Steele, B.Sc.	J. B. McKinna.
Bacteriology	A. P. Steele, B.Sc.	J. B. McKinna.
Hygiene ...	A. P. Steele, B.Sc.	J. B. McKinna.
Surgery	W. P. Blount.	D. F. Macpherson.
Obstetrics	W. P. Blount.	K. W. Harcourt.
Medicine	W. P. Blount.	A. Malaga, B.Sc.
Clinique	W. P. Blount.	S. Simpson.
Parasitology	—	C. Harvey.

Best Aggregate (Macfarlane Medal) for Final Year—W. P. Blount.
Special Medal—A. Savage, B.S.A., D.V.M.
Gemmell Scholars—J. B. McKinna and J. Atkinson.
Tindal Scholar—G. Johnson, M.R.C.V.S.
Centenary Fellow—G. B. Brook, M.R.C.V.S.

Foot-and-Mouth Disease in Man.*

By J. A. Arkwright, M.D., F.R.C.P., F.R.S.,
Assistant Bacteriologist, Lister Institute, London.

Although the occurrence of foot-and-mouth disease in man has lately been mentioned in the daily press as a definite risk, human cases are rarely heard of nowadays, and it is doubtful how many of those formerly so described were really due to this cause.

During the latter half of the nineteenth century, when the disease was very prevalent in our flocks and herds, many cases of stomatitis in man, sometimes accompanied by vesicles on the hands, were attributed to the same infection. Some of the human patients had been in contact with diseased cattle, but most of them were believed to have been infected by drinking their milk. The transmission from man to man has only rarely been suspected. In some of the years during that epizoötic period not only was the total number of animals attacked very large, but the number which were sick at the same time must have been very great, since slaughter was not adopted as a general policy.

In 1869 A. McBride recorded a number of cases in man collected from 22 different sources. All these he regarded as undoubted infections with foot-and-mouth disease. In some instances several members of one household were affected. Of four cases of vesicular stomatitis which he observed himself three occurred in one family after drinking the milk of cows suffering from the disease; the fourth, a butcher, appeared to have directly inoculated his mouth by holding an infected knife between his lips. In the same year Dr. Thorne Thorne investigated an epidemic of stomatits the distribution of which was associated with the milk supply. He inclined to the view that the infection was derived from cattle suffering from foot-and-mouth disease. In 1884 an epidemic of severe vesicular tonsillitis and enlarged glands occurred at Dover. In this outbreak also infection by the milk of cows suffering from foot-and-mouth disease was suspected. About the same time a smaller outbreak attributed to a similar cause was reported from Norfolk; the patients were children, and two of them died. Cases of foot-and-mouth disease occurring singly or in groups have often been described on the Continent. In 1896 Bussenius and Siegel collected records of over 1,500 supposed cases of this disease in human beings, including 600 which had recently occurred in Prussia.

The real nature of many of these outbreaks, however, was disputed at the time and subsequent experience has suggested that cases of sore mouth and throat and of pustular eruption due to other causes have often wrongly been accepted as manifestations of foot-and-mouth disease in human beings. Epidemics of fever and tonsillitis due to streptococci, in which the infection is spread by milk, are now well known and not infrequently the infection has been traced to cows with inflamed udders. Moreover, since milch cows attacked with foot-and-mouth disease often suffer from mastitis due to secondary infection with streptococci and other bacteria, it seems probable that some of the milk-borne epidemics referred to above were due to bacterial infections and not to foot-and-mouth disease.

* Reprinted from *The Lancet*, June 9th, 1928.

Transmission to Man.

In 1921 Lebailly investigated ten cases of aphthous stomatitis, believed to be foot-and-mouth disease, which were attributed to drinking infected milk. He made three attempts to transfer the infection from man to cattle without success. He also tried three times to transmit foot-and-mouth disease from cattle to man, but with negative results. Lebailly accordingly expressed his doubts as to the possibility of the transmission of foot-and-mouth disease to man. But in spite of this and other adverse criticism, which has been in part a reaction against the former too ready belief in human susceptibility to foot-and-mouth disease, there can be little doubt that this disease has occasionally been transmitted to man. For instance, the case is recorded of a veterinary surgeon who accidentally infected himself from an animal which he was examining and had five vesicles on the lips and tip of the tongue, and some of the cases related by McBride appear to be based on equally good evidence. In three or four instances the diagnosis has been confirmed by the re-infection of animals from man. Schautze in 1893 described a case of foot-and-mouth stomatitis in man from which he successfully inoculated two calves. Bertarelli, in 1908, recorded two human cases acquired by direct contact with animals; in both there were large vesicles in the mouth and on the lips. With vesicular fluid from one patient he obtained typical vesicles on the ear and lip of a calf. Favero also is said to have successfully inoculated a calf from a human case in 1914. It must, however, be remembered that vaccinia and herpes labialis and some lesions due to coccal infections are also transmissible to animals and vice versa.

Comprehensive and critical reviews of all available records of reputed foot-and-mouth disease in man are to be found in the papers by Cadiot (1914) and by Gins and Krause (1924). The diagnosis of foot-and-mouth disease in man can only be conclusively established by producing in a susceptible animal local and generalised vesicles recognisable by one familiar with the disease, and by showing that immunity to the same type of foot-and-mouth disease results. These criteria have never been satisfied, but no doubt can reasonably attach to the two following records of foot-and-mouth disease in man:—

Pape, who with Waldmann in 1921 discovered the method of infecting guinea-pigs with foot-and-mouth disease, cut his thumb with a broken glass vessel whilst collecting virus from a pig. Two days later he had slight headache and shivering. On the third day vesicles began to develop on the palms and soles and continued to appear at these sites, but not elsewhere, for two days. There were 25 vesicles in all varying in size from a flax-seed to a cherry-stone. They contained clear fluid and rapidly healed without suppuration. The only buccal lesion was a slight swelling and tenderness on the gum on one side at the time of the cutaneous eruption. This occurrence was before the discovery of the susceptibility of guinea-pigs and no animals were inoculated, but Pape, when later inoculated with foot-and-mouth virus, proved to be immune.

In 1922 several cases of vesicular stomatitis, sometimes with vesicles on the hands also, occurred in the province of Como, where there was an epizoötic of foot-and-mouth disease. Clear fluid from the vesicles of one of these patients with bullous stomatitis was taken to Milan and inoculated by Pancera into guinea-pigs and a calf, all of which developed typical lesions.

Diagnosis of the Disease.

The important points in clinical diagnosis in man in the present state of knowledge appear to be initial fever and superficial vesicles containing clear fluid on the lips and buccal mucous membrane, with perhaps vesicles on the flexor aspects of the hands and feet. Both the incubation period and the period of fever and eruption are short, not exceeding three or four days each. An exact and detailed account of more cases whose diagnosis is incontrovertible is very much needed. Sometimes cases have been described as foot-and-mouth disease in man in which besides stomatitis a skin eruption has occurred on the lower legs, forearms, and backs of the hands and has especially affected the beds of the nails, causing the latter to be deeply grooved or even shed. There does not seem to be any experimental evidence confirming the diagnosis in such cases and in Pape's case the skin lesions were confined to the palms and soles as is also the case in guinea-pigs. It is questionable whether the diagnosis can certainly be made at the present time without animal experiment, especially where infection by milk is suspected. Such an investigation can only be carried out in this country with the special sanction of the Ministry of Agriculture.

References.—McBride, A.: Brit. Med. Jour., 1869, ii., 536. Cadiot: Rec. de Méd. Vétér., 1914, xc., 296. Gins, H. A., and Krause, C.: Ergebniss. d. allgem. Path. u. pathol. Anatom., München, 1923-24, xx., 2 Abt., 805.

Foot-and-Mouth Disease.

Importation of Chilled Meat.

In the House of Lords on June 27th, Lord Strachie moved: "That it is undesirable that the Ministry of Agriculture should accept foreign inspection of imported meat from South American countries where foot-and-mouth disease prevails while refusing to accept foreign inspection of meat from Continental countries." He also moved for papers giving the correspondence with Continental countries in regard to the embargo contained in the Order of June, 1926, of the Minister of Agriculture, and with the Argentine Government with reference to the system of inspection of meat for export to this country. The justification, Lord Strachie said, for raising this matter again so soon was that the reply of the Parliamentary Secretary to the Ministry of Agriculture to Lord Ernle on May 8 was neither satisfactory nor convincing. He (Lord Strachie) would quote an authority greater than his own with reference to agriculture—a gentlemen whose articles were often read by their Lordships—the Agricultural Correspondent of *The Times*. On May 14 that gentleman wrote:—"The difficult position in which the Ministry of Agriculture and the Government are placed in consequence of the recurring outbreaks of foot-and-mouth disease is fully recognised by farmers." He went on to say that the discussion in the House of Lords did not point to any appreciable improvement being in prospect. He added that Lord Stradbroke had sought to draw reassuring conclusions from recent reductions in the number of outbreaks, but that the argument relating to depreciation in meat from extended compulsory, as compared with voluntary, detention in cold storage was also unconvincing.

Chilled meat, continued Lord Strachie, was practically taking the place of frozen meat in this country, thus increasing the danger of infection. The outbreaks of foot-and-mouth disease generally occurred around our big towns and Ireland and Scotland had been practically immune. People who knew more about the matter than he did put this down to the fact that no chilled meat went to the country districts of Ireland and Scotland. A steady flow of infection was coming from the Argentine and from other countries, and both Canada and the United States of

America absolutely refused to receive any chilled and frozen meat. It was true that the Argentine Government were doing their best to ensure notification of foot-and-mouth disease, but he was informed that their requirement in that respect was simply ignored, and that the disease was rampant in that country. The inspection which had been promised in Argentina was not of very great value. An animal might be in perfectly good health when it was slaughtered, but when the carcase was transported elsewhere it might become infected on the way, and the meat might arrive in this country with the infection upon it. The only remedy, in his view, was to forbid any chilled meat coming into this country, and to say to Argentina that while we did not wish to stop their meat coming here we should require it to come in a frozen state.

GOVERNMENT REPLY.

The Earl of Stradbroke, Parliamentary Secretary to the Ministry of Agriculture, assured their lordships that the Government had very good reasons for discriminating in the regulations regarding meat imported from the Continent and that which came from South America. It had been clearly proved that infection was introduced into this country by means of carcases imported from the Continent. But nothing had yet been proved showing that disease had been introduced from South America. The Ministry of Agriculture, however, had naturally taken every step to prevent infection from being brought in. From a report in an Argentina newspaper it appeared that the inspection carried out in that country was very complete and that every possible care was taken to detect infection in the carcases. The two inspectors which the Ministry of Agriculture had in Argentina spoke in the same way. They reported that they were given every facility to carry out their duties, and indicated that the Government of Argentina were acting up to the letter and spirit of their undertaking. The experiments conducted by the Research Department had not yet determined how long the virus remained alive in the body, blood or bones of the carcase. As to the suggestion of the noble lord, that the meat should be frozen and not chilled, there was no evidence to show that frozen meat was less liable to contain the virus. As summaries of the correspondence between the Dutch Government and the Board of Agriculture and between the Argentine Government and the Board of Agriculture had been published, he hoped the noble lord would not press his motion for papers.

LORD BLEDISLOE'S INVESTIGATIONS.

Lord Bledisloe said he had just returned from a visit to South America, where he concluded investigations which he had conducted in an official capacity in January. He had found that not only were the Argentine Government most scrupulous in their own measures for effective inspection, but they were quite ready to admit inspection by duly qualified persons appointed and sent out by His Majesty's Government. It was not the view of a large number of medical and health authorities in this country that frozen meat was more wholesome than chilled meat; and, moreover, the public had developed a taste for chilled meat as being pleasanter and more nutritious. But with respect to the disease, there was nothing to show that the danger would be lessened in the slightest degree by the meat being frozen rather than chilled. The Argentine Government and stockowners had instituted a most efficient system of inspection in order to meet the requirements of this country. The society of the stockowners had sent an invitation to ten or twelve members of both Houses of Parliament to go out to the Argentine as their guests, and see for themselves the system of inspection at work.

Lord Ernle said that it should be made a punishable offence for a butcher to part with any bones of this imported meat which had not been boiled. A quarantine should be placed upon chilled meat from the Argentine. The Argentine authorities were doing their best, but the great danger we had to face was that infection had been regarded in that country as normal for so many years that the people there could not wake up to the position.

The motion was by leave withdrawn.

The Veterinary Record.

7th July, 1928.

THE ANNUAL CONGRESS.

The time is fast approaching when our members will be making their arrangements for attending the Congress, which this year is to be held in a centre untouched by the "National" for something more than forty years. Newcastle-on-Tyne is a busy commercial centre, its hotels having regular visitors, and for this reason we would urge on our readers the importance of early booking. Ample accommodation has been secured by the Provisional Committee, but it remains with the individual to make his own arrangements without undue delay. For gentlemen who will be attending the Congress alone, we would point out the advantages of Easton Hall, a building normally used as a hostel for students of Armstrong College and the College of Medicine. Easton Hall will be opened specially for the Congress, and the Provisional Committee wish to see it well patronised. The coastal area, Whitley Bay and Tynemouth, will appeal to those who favour a seaside holiday. Whitley Bay is a favourite resort, with an excellent children's beach, and all the usual seaside amusements, and we hope that at least some of our members will combine the business of the Congress with a family holiday.

This year's programme includes certain innovations which we hope will prove not only attractive, but will also conduce to the more expeditious conduct of the business. The inaugural meeting is to be held during the afternoon of Saturday, September 1st, and is to be followed by a dance in the evening, designed to create that spirit of jolly, good fellowship, which should augur well for the success of the Congress. Sunday morning, September 2nd, is devoted to a more serious innovation, in the form of a church service at the City Cathedral of St. Nicholas. The Provisional Committee believe that this will add much to the dignity of the proceedings, and will bring the "National" Congress more into line with the annual gatherings of other learned bodies. We look forward to seeing a large attendance of members and their ladies at this function, and we hope that as many members as possible will wear Academic dress, or Service dress for military members, for the occasion.

Monday, September 3rd, is set apart as a day for Veterinary State Medicine. A paper is to be given by Mr. H. T. Matthews, of Liverpool, in the morning, followed in the afternoon by visits to model dairies. The parties will proceed, one to the premises of Mr. Sanderson, Eshott Hall, Northumberland, and the other to the model dairy of Mr. Greenshields, Herrington, Durham. Both journeys will be made by motor coach, and ladies will be specially welcomed. Earlier in the day there will be the formal opening of the Trade Exhibition by the President, and in the evening the President will hold his reception. Tuesday morn-

N.V.M.A. CONGRESS AT NEWCASTLE-ON-TYNE.
September 1st to 7th, 1928.

PROGRAMME.

SATURDAY, SEPTEMBER 1st.

10 a.m.: Council Meeting.

3-30 p.m.: Inaugural Meeting, with adjournment for tea at 4-15 p.m., and followed by the business part of the meeting.

8-30 p.m.: Dance, with Cards available for non-dancers.

SUNDAY, SEPTEMBER 2nd.

10-30 a.m.: Church Service at St. Nicholas Cathedral (Academic Dress optional).

MONDAY, SEPTEMBER 3RD.

9-30 a.m.: Formal opening of the Trade Exhibition by the President.

10 a.m.: Paper: "The Veterinarian in Public Health," by Mr. H. T. Matthews, Liverpool. Discussion opened by Mr. James McAllan, Aberdeen.

Afternoon: Visits to Model Dairies.

8-30 p.m.: President's Reception.

TUESDAY, SEPTEMBER 4th.

10 a.m.: Paper: "Lamb Dysentery," by Mr. T. Dalling, Beckenham. Discussion opened by Mr. T. J. Bosworth, Cambridge.

2-30 p.m.: Paper: "The Horse as a National Economic Factor," by Major General Sir John Moore, London. Discussion opened by Mr. T. Eaton Jones, Liverpool.

Evening: Civic Reception.

WEDNESDAY, SEPTEMBER 5th.

10-30 a.m.: Paper: "The Constitutional Factor in Disease," by Dr. F. A. E. Crew, Edinburgh. Discussion opened by Mr. W. C. Miller, Edinburgh.

2 p.m.: Operations and Demonstrations in Royal Artillery Drill Hall, including the Castration of Cryptorchids by the Flank and Inguinal Methods; Ovariotomy in the Heifer; an Abdominal Operation in the Dog; Spaying of Sows; the *post-mortem* Demonstration of Small Trichostrongyles in the Stomach of Sheep; Tuberculin Tests in Poultry; Caponising of Cockerels.

Evening: Annual Banquet.

THURSDAY, SEPTEMBER 6th.

10 a.m.: Paper: "The Adulteration of Foods and its Effects on Animals," by Professor R. G. Linton, Edinburgh. Discussion opened by Dr. J. F. Tocher, Aberdeen.

2-30 p.m.: Paper: "Veterinary Education—Reconstruction," by Colonel G. K. Walker, Abingdon. Discussion opened by Dr. O. Charnock Bradley, Edinburgh.

7-30 p.m.: Popular Lecture: "Milk," by Lieut. Colonel J. W. Brittlebank, Manchester.

FRIDAY, SEPTEMBER 7th.

Closing Meeting.
Council Meeting.
Excursion by Motor Coach.

In addition, plans are being made for ladies to visit the Cathedral, and other places of interest in Durham. Facilities for Golf and Tennis will be available. Ladies will have an opportunity to attend the visit to one or more Model Dairies, on Monday September 3rd, when a party will be entertained to tea by Mr. Sanderson, Eshott Hall. A Masonic meeting is also to be arranged.

List of Recommended Hotels.

Royal Turk's Head, Grey Street. (HEADQUARTERS). Reserving provisionally 25 single and 25 double rooms. Bed and table d'hôte breakfast, 10s. each, or bed, table d'hôte breakfast, lunch and dinner, meals at stated times, 17s. 6d. each.

Easton Hall. A hostel used in connection with Armstrong College, can accommodate single gentlemen. Since it will be necessary for the Warden and the Staff to curtail their holiday to open the hostel, the Committee hope that those gentlemen attending the Congress alone will take full advantage of the facilities offered. Bed and breakfast, 7s 6d., dinner, 3s. 6d.

Central Station. Bed and breakfast, single from 12s. 6d., double from 24s., lunch, 3s. 6d.; dinner, 6s. 6d. Unless rooms are booked by 1st August they cannot be reserved for longer periods than bed and breakfast.

County, Neville Street. Bed and breakfast, 10s. 6d.; daily terms, 17s. 6d.

Grand, Barras Bridge. Bed and breakfast, 10s. 6d.; daily terms, 18s. 6d.

Imperial (Private), Jesmond Road. From 11s. 6d. daily.

Crown, Clayton Street. Bed and breakfast, 8s.; daily, 13s. 6d.; weekly, 3½ guineas.

St. Margarets (Private), Osborne Road. Bed and breakfast, 8s. 6d.; daily, 13s.

Central Exchange, Grey Street. Bed and breakfast, 8s.; lunch, 2s.; dinner, 4s.

Douglas, Grainger Street. Terms on application.

Kensington (Private), Osborne Road. Bed and breakfast, 6s. 6d.; weekly from 37s. 6d.

Osborne (Private), Osborne Road. Bed and breakfast, 8s. 6d.; weekly, 3½ guineas.

Langham (Private), Osborne Road. Bed and breakfast, 7s. 6d.; weekly, 66s.

COAST AREA.

Avenue, Whitley Bay. Bath, bed and breakfast, 9s.
Waverley, Whitley Bay. Bed and breakfast, 10s. 6d.
Grand, Tynemouth. Bed and breakfast, 9s. 6d.; daily, 14s. 6d.
Esplanade, Whitley Bay. Daily, 12s. 6s.

The coast area of Whitley Bay and Tynemouth forms an excellent locality for those desiring a seaside holiday, being situated some seven or eight miles from the city, and connected with it by a good and frequent service of electric trains.

Information regarding train services will be available at a later date.

Applications for accommodation in Easton Hall should be addressed to Mr. W. Lyle Stewart, M.R.C.V.S., Armstrong College, Newcastle-on-Tyne.

NEWCASTLE-ON-TYNE IS ESSENTIALLY A COMMERCIAL CITY, AND THE HOTELS HAVE THEIR REGULAR VISITORS. THE PROVISIONAL COMMITTEE PARTICULARLY DESIRE, THEREFORE, TO URGE THE IMPORTANCE OF EARLY BOOKING ON GENTLEMEN PROPOSING TO ATTEND THE CONGRESS.

ing will provide food for the research workers, in the shape of Mr. Dalling's paper on "Lamb Dysentery," while the afternoon will be devoted to Sir John Moore's paper on "The Horse as a National Economic Factor." Several delegates have already been appointed to represent interested bodies at the discussion on this paper. In the evening the delegates are to be accorded the honour of a Civic Reception by the Lord Mayor and Corporation of the City.

On Wednesday morning Dr. F. A. E. Crew will present his paper on "The Constitutional Factor in Disease." Those who heard Dr. Crew's address at Aberdeen will need no further inducement to attend this feature of the programme, while those who were less fortunate may be assured that in Dr. Crew's paper they will find much valuable information concerning those obscure conditions which are often labelled "Constitutional Disease."

Wednesday afternoon will be given up to operations and demonstrations, the only section of the Congress which must be held outside the precincts of Armstrong College. For this part of the programme an artillery drill hall has been secured, which will provide ample space, both for surgeons and spectators. It is hoped to demonstrate operations which the practitioner is frequently called upon to perform, in some cases shewing different methods of solving the same problem.

The Annual Banquet takes place on Wednesday evening, in exceptionally pleasant surroundings, and arrangements have been made for the principal speeches to be broadcast.

Thursday is devoted to two papers, that in the morning by Professor Linton on "The Adulteration of Foods and its Effects on Animals," and that in the afternoon on "Veterinary Education—Reconstruction," by Colonel G. K. Walker. A popular lecture on "Milk" is to be delivered by Colonel Brittlebank in the evening.

Friday is given up to the Closing Meeting, followed by the Excursion, which will certainly pass through some of the most beautiful Northumberland scenery, probably visiting the ancient and historic town of Alnwick on the journey.

We are confident that all our members will endorse our opinion that the Provisional Committee have provided an attractive programme, giving ample time for full discussion of the various papers presented, and allowing opportunity for those members who may wish to follow their own devices. We are certain that for many of these the Roman Wall will have its attractions. Dr. Bradley will give a short talk, illustrated by lantern slides, to enthusiasts early in the Congress week, as a preliminary to visits to the wall. There are also features of antiquarian interest within the city, and arrangements are being made for these to be visited during the week. Plans are also being formulated for the ladies to visit the magnificent cathedral and castle at Durham on one afternoon. Durham is a wonderful old city, well worth a visit, and we can commend this trip to the ladies. The usual features, golf and tennis, will also be available for those wishing to play games, enthusiasts of the latter pastime having been granted permission to use the playing fields of the Armstrong College Students' Athletic Union. In the College buildings there will be a lounge, adjoining the trade exhibition, where those who may be so disposed can meet friends and partake of light refreshment in comfort.

The provision of luncheons at a moderate charge in the University Union adjoining the College during Congress week has been arranged, by permission of the authorities—a feature which we believe will appeal to those who will attend the various functions.

It is hoped to be able to provide luncheons at a moderate charge in the Students' Union adjoining the College during Congress week, a feature which we believe will appeal to those who will attend the various functions.

A Ladies' Committee is in process of formation to make any further provision for the comfort of ladies attending the Congress, and the results of their deliberations will be added to the programme as they report to the Provisional Committee, but broadly it may be said that an endeavour has been made to provide features which will prove attractive, without being too exhausting. Each morning ladies will be free to explore the mysteries of the shops, of which there are many in Newcastle well worth a visit. Jesmond Dene, and other public parks in the city, will repay the consideration of the ladies, while for those who may be staying in Newcastle a visit to the coast can be easily and cheaply made either by the frequent service of electric trains, or by the ubiquitous motor coach.

The beautiful buildings of Armstrong College, situated in one of the most attractive parts of the city, form an admirable setting for the Congress; generous assistance has been given by the authorities of the College, and we confidently anticipate a record attendance at this year's gathering.

Army Veterinary Service.

Movements of Officers.

Brevet Lieut.-Colonel W. E. Schofield, O.B.E., was posted to Woolwich for duty on the 1st April, 1928. He sailed for India for a full tour of duty on the 8th June, 1928.

Major R. W. Mellard, D.S.O., was posted from Aldershot to the Eastern Command on the 12th April, and is now doing duty at Brighton.

Major H. Stephenson, M.C., arrived home from India on the 13th April, 1928, and is now doing duty at Aldershot.

Major C. A. Murray arrived home from Gibraltar on the 23rd April, 1928, and is now doing duty at Woolwich.

Lieutenant A. G. Ralston was posted from Aldershot to the Northern Command on 26th April, 1928, and is now doing duty at Catterick.

Major E. G. Turner, D.S.O., was posted from Aldershot to the Scottish Command on the 1st June, 1928, and is now doing duty at Edinburgh.

Major J. Bell arrived home from India on the 22nd June, 1928, and has been posted to the Aldershot Command for duty.

London Gazette—War Office—Regular Army.

June 22nd.—Lt.-Col. H. Gamble, O.B.E., F.R.C.V.S., retires on ret. pay (June 23); Maj. (Bt. Lt.-Col.) W. E. Schofield, O.B.E., to be Lt.-Col. (June 23).

Territorial Army.

Lt. A. M. Fulton is restd. to estabt. (May 28).

CLINICAL AND CASE REPORTS.

Colic in Cattle: Some further Cases treated Surgically.

By R. H. SMYTHE, M.R.C.V.S., Camborne.

The purpose of recording these cases, in addition to that described in the *Veterinary Record* of October 29th of last year, is to draw attention to the prevalence of bowel displacement in cattle and to the value of surgical intervention, as well as to its simplicity and safety. Whilst intussusception has always been regarded as the most frequent surgical abnormality in bovines, it has been the lot of the writer to meet with very few cases; whilst torsion of either large or small intestine or strangulation are of common occurrence and are undoubtedly often unsuspected by practitioners who omit the *post-mortem* examination. Exploratory laparotomy is so simple in the ox and produces such slight disturbance that it is infinitely preferable, particularly in those cases in which rectal examination yields no information.

Case 1. SUBJECT: Cross-bred Guernsey cow, six months' pregnant.

April 14th.—SYMPTOMS: Colic, without intervals of relief, frequent turning of head towards right flank, particularly whilst lying. Complete cessation of all bowel movement. Rectal examination revealed a hard, painful mass in the right intrapelvic region the size of a cocoanut. Owner refused to consent to operation.

April 16th.—Cow in a state of collapse. Owner very keen on operation, the writer less so.

The right flank was opened under chloroform anæsthesia. The mass, palpated per rectum, consisted of a loop of large intestine which had passed through a slit in its own portion of mesentery and had thus become strangulated. The serous surface of the bowel was missing; the muscular layer was necrotic in parts. The mesentery was intensely congested and the omentum was studded with vascular prominences, having the appearance of miniature cotyledons. Peritonitis was advanced and a sanguineous exudate poured from the operation wound. The bowel was freed by dividing the mesentery, well swabbed with dilute Fecto solution and replaced. The owner reported that normal action recommenced four hours later.

April 18th.—Being unable to discover either the owner or the patient, I concluded that the body had been removed, but on my homeward way I observed the cow peacefully grazing, a mile from the farm, with the rest of the herd. Recovery has been uneventful.

Case 2. SUBJECT: Pedigree Guernsey cow, 8½ months' pregnant.

April 21st.—SYMPTOMS as in previous case. Rectal examination negative, excepting that the hand returned bloodstained. Exploratory laparotomy performed. The intestines were normal, but an obstruction could be felt at the pyloric orifice of the abomasum. This apparently consisted of portions of binder twine. The stomach was distended with food and gas, but manipulation of the mass brought about its disintegration with a sudden disappearance of tympany. The bowels acted five hours later.

April 23rd.—Appetite normal, no pain.

April 24th.—Cow was turned out with the herd to graze, calved at her normal time and gave no further trouble.

In this case the incision was made in the left flank owing to the advanced stage of pregnancy. Whenever possible, the right flank is to be preferred on account of the presence of omentum and less interference from the rumen.

Case 3. SUBJECT: Guernsey cow, eight months' pregnant.

SYMPTOMS: Acute colic for three days, passage of blood and mucus, but practically no faeces.

Exploratory operation yielded no information.

A fortnight after calving the cow died from traumatic pericarditis due to the presence of a wire nail.

Case 4. SUBJECT: Friesian cow, not pregnant.

May 20th.—Owner stated that the animal had suffered from persistent colic and "stoppage" for six days and had been treated with linseed oil. Her characteristic attitude was at full stretch with her fore limbs advanced and her hind feet well behind her. The abdomen was tympanitic and palpation of the right flank produced fluid sounds. The cow continually ground her teeth and and her expression depicted acute misery. This was the owner's only cow, and she had been in the habit of taking a short cut to pasture down the side of a cliff, a hundred feet high, down which she had worn a foothold.

Rectal examination revealed the presence of a false membrane, extending from the pelvis to an unknown destination. This was fairly easily broken down and the patient was left for twenty-four hours in the hope that any incarcerated bowel might be freed thereby.

May 21st.—No improvement. Operation performed through right flank. In the left lumbar region, a second false band extended between two points in the abdominal wall and trapped between it and the latter was a loop of large intestine, distended with fluid and gas. The "band" could not be brought into view and its nature must remain a mystery. It was divided with a scalpel and the wound in the abdomen sutured. Before the completion of the operation, loud peristaltic sounds were heard and flatus was passed persistently. Recovery has been particularly rapid, the wound healing by first intention.

Intestinal Carcinoma in the Dog.

By N. G. MITCHIE, M.R.C.V.S., Liverpool.

Subject.—Black and tan terrier; age, six years.

History.—When about fifteen months' old, it was violently knocked to one side by a passing motor-car. Nothing was noticed wrong at the time. About nine months ago the dog began to have mild attacks of vomiting at irregular intervals, but no professional advice was obtained until three weeks ago, when the vomiting became continuous, with a rapid emaciation and dulness.

Palpation.—This revealed the presence of two elongated enlargements on the course of the small intestine.

Operation.—Although a serious prognosis was given, the owner agreed to operative measures. The animal received one grain morphine suphate and, half-an-hour later, chloroform and æther mixture was adminstered. The usual mid-line incision was made and the affected part brought to view. This consisted of two uniformly-

shaped enlargements, each about the size of a turkey egg and slightly elongated in shape. About half-an-inch of normal bowel separated them from each other. They were of firm consistence, fleshy and attached in parts to a greatly-thickened omentum. These enlargements involved the duodenum about four inches from the stomach. I removed the affected part and performed an end-to-end anastomosis. The dog never properly recovered and died three days later.

Post-mortem.—On incising the enlargements I was struck by the fibrous nature of the tissues, especially the external part, which seemed to be composed of grossly indurated omentum. The different coats of the intestine could be made out, but greatly enlarged, especially the sub-mucous coat. The bowel lumen was continued through the swellings but had an increased diameter of about one inch. These cavities were lined by a thickened mucous membrane, smooth and not puckered into folds as in the contiguous bowel. The mesenteric lymph glands were normal and there was no evidence of tumour formation elsewhere.

NOTE.—Professor Matheson, Royal (Dick) Veterinary College, examined the growths and reported: "Carcinoma with considerable evidence of necrosis."

J. McCunn, Esq., M.R.C.V.S., reported in the *Veterinary Record*, May 2nd, 1925, a case similar to the above in many aspects.

Difficulty Experienced in Diagnosis of Haemorrhagic Septicaemia in Cattle.

By V. P. GOKHALE, G.B.V.C., Perak, F.M.S.

This short note is contributed with the object of bringing to the notice of the veterinary profession that occasionally considerable difficulty is met with in field work in arriving at a positive diagnosis of hæmorrhagic septicæmia, especially in cattle, and therefore great care must be taken to avoid making an incorrect report and the adoption of wrong treatment.

During recent outbreaks of hæmorrhagic septicæmia among cattle in the State of Perak the following symptoms and *post-mortem* lesions were noticed in a majority of cases:—

(1) Fœtid diarrhœa, mixed with mucus and even dysentery in latter stages in several cases.

(2) Conjunctivitis: all grades of inflammation were seen, from the engorgement of vessels with slight congestion, as seen in rinderpest, up to a scarlet condition of the mucous membrane which is absent in rinderpest. Lachrymation was in all cases watery, unlike the muco-purulent discharge seen in rinderpest soon after commencement of the discharge.

(3) Ulceration and desquamation of the mucous membrane of the oral cavity; mouth smelling fœtid.

(4) Coat dry, rough and staring (hide-bound).

(5) Loss of appetite from the onset of illness.

(6) Temperatures were taken of a fair number of affected animals, but a rise from 104° to 105° F. was found only in three cases.

Microscopic examination of smears taken from the peripheral and heart blood of a number of animals was practically negative. More will be said about this later on.

The *post-mortem* lesions were almost identical with those seen in rinderpest, but this disease was ruled out for the following reasons:—

(1) Absence of general elevation of body temperature.

(2) Very slight infectivity among the contacts.

(3) Non-existence of rinderpest, not only in Perak but elsewhere in Malaya except Malacca, from which place no cattle were imported.

(4) The course of the disease. It was in most cases too short for rinderpest, being variable, namely, a few cases dying after a very short illness (in such cases diarrhœa was generally absent) but the majority taking from three to eight days with rare recoveries.

As the blood examinations were at first quite negative, the sickness was thought to be due either to arsenical or lead poisoning, as many of the symptoms and *post-mortem* lesions, and the high mortality were very similar to those caused by poisoning by these substances. There was more reason to suspect lead poisoning from the history obtained that contamination of the water, where cattle were watered, had occurred from paint used for a tin dredge. Stomach contents and a piece of liver from two different cases were therefore sent to the Government Analyst who, however, did not find any arsenic, lead or other metallic poison in the material. Upon receipt of this report, hæmorrhagic septicæmia was thought to be the only possible cause, but the main difficulty was in demonstrating the bi-polar bacillus in the blood, although several smears from a number of animals during the early as well as the later stages of the illness were examined. The Government Veterinary Surgeon, Mr. G. B. Purvis, F.R.C.V.S., found what he considered to be the bacilli of hæmorrhagic septicæmia in the smears, but they were so rare (one per smear) that he could not rely upon the finding for diagnosis. Cocci were also present in the blood, and it is possible for a person trying to establish diagnosis to mistake two newly-divided cocci for a bi-polar bacillus. Thereupon, he made cultures from the blood of affected animals on potato and growth of the *B. bovisepticus* (*Pasteurella boviseptica*) was obtained, and thus the etiology of the outbreak was established. I may mention here that Mr. Purvis had never seen hæmorrhagic septicæmia before, and thus was handicapped adversely.

It may be doubted by some that the bacillus of hæmorrhagic septicæmia can be grown successfully on potato, as no mention of this possibility seems to have been made in the older text books; but in the "Manual of Determinative Bacteriology," by Bergey, Second Edition, p. 260, it is stated that a greyish growth on potato of *P. boviseptica* can be got, and this ability to grow on potato is used as his key to distinguish the species. The optimum temperature for growing the parasite is 37° C. Besides, this is the only Pasteurella that is known in cattle, naturally at least.

In the Third (English) Edition of "Special Pathology and Therapeutics of the Diseases of Domestic Animals," by Hutyra and Marek, Vol. I, p. 137, it has been stated that occasionally few bacteria (bi-polar bacilli) exist in the blood as well as in the exudates of animals affected with hæmorrhagic septicæmia and in such doubtful or negative cases it is advised to inoculate several test animals, especially rabbits. This test could not be carried out by the Government Veterinary Surgeon, as no rabbit or even a guinea-pig was obtainable then, and so cultures had to be made.

It is rather an interesting fact that no outbreaks of hæmorrhagic septicæmia in cattle in the Federated Malay States had been recorded in the past. But an outbreak among buffaloes was recorded for the first time in Perak in 1925, although individual cases of the sub-acute œdematous type among buffaloes have been known to occur in the Federated Malay States for the past twenty years at least.

I would like to mention that only the pectoral type of the disease was noticed among buffaloes both of Siamese and Indian breeds during the outbreaks of 1925 and 1927, and the bi-polar bacillus, although found in blood smears, was very rare; whereas in this year's (1928) outbreaks both among buffaloes and cattle, only the intestinal form of the disease was seen and the bi-polar bacillus in blood smears was not in sufficient number to determine diagnosis. The cutaneous œdema and swellings over the region of the head, submaxillary space and throat were never noticed in the last outbreaks.

It will not be out of place to mention here that in Eastern Asia buffalo disease has been frequently mistaken for rinderpest, and this fact has been stated on p. 143, of Vol. I, third edition (English) of the "Special Pathology and Therapeutics of the Diseases of Domestic Animals," by Hutyra and Marek.

ABSTRACT.

[Experimental Black Tongue of Dogs and its Relation to Pellagra. GOLDBERGER and WHEELER. *Public Health Reports, U.S.A.*, Vol. 43, No. 4. Jan. 27, 1928, pp. 172-217].

By black tongue the authors refer to the disease generally known in this country as Stuttgart disease, and their investigations were prompted by the description given by Chittenden's book, "The Nutrition of Man," of the lesions produced in dogs, by a sudden change in diet from one containing meat and milk to one in which these are entirely wanting. The lesions described resembled those occurring in the human subject in pellagra and it was in the course of their investigations of that disease that the experiments with dogs, recorded at length in the paper under review, were carried out. In the first experiment five dogs were used. The diet used comprised cornmeal, farina, rice, cow peas, lard, cod-liver oil, cotton seed oil, calcium carbonate, sodium chloride, gelatin, and tomato juice, in such proportions as to yield 68.5 grams of protein, 58.5 grams of fat and 205.9 grams of carbohydrate. Within seven to ten weeks the dogs all developed lesions which, except for variations, possessed the same general characters. These were salivation and lachrymation, congestion of the buccal mucous membrane, desquamation of the skin of the scrotum, necrosis of patches of mucous membrane of the lips, gums and fauces, and later of the margins of the tongue with marked fœtid breath. There was blood-stained and fœtid diarrhœa. At the *post-mortem* examination the lesions found included inflammation and necrosis of the mucous membrane of the mouth, tongue, pharynx, larynx, and upper part of the œsophagus. The mucous membrane of the stomach shewed severe congestion. In the anterior half of the small intestine there were hæmorrhagic patches. The mucous membrane of the large intestine shewed small hæmorrhages, and there were numerous hæmorrhages in the sub-mucosa of the rectum.

In the second experiment five dogs were again used, but the diet was modified as regards the quantities of the constituents so as to increase the calories to 2,400 as compared with 1,600 in the first. The symptoms and lesions again developed in all the dogs, the interval between the beginning of the experiment and their appearance ranging from 30 to 117 days.

In a third experiment six dogs were used and the diet contained corn meal, corn starch, farina, rice, cane sugar, sweets potatoes, cabbage, lard and sodium chloride. This diet was a somewhat simplified form of that with which Goldberger and Wheeler had produced pellagra in 5 out of 11 human subjects who volunteered for the experiment.

Five out of the six dogs developed the typical symptoms and lesions within periods ranging up to 16 weeks. Circumstances compelled the authors to stop the experiment at this point and it is possible that the sixth dog might have developed the condition. It is noted that the initial congestion of the lips may be intermittently present, and so may escape observation. The congestion is at first streaky, but subsequently it becomes diffuse. The tongue becomes involved some time after the lesions have been detected on the lips and cheeks as a rule. Sooner or later the congested areas become necrotic, and by the time this has occurred appetite begins to fail. In the later stages vomiting may take place, especially if forced feeding is attempted.

The temperature is as a rule more or less normal until near the end.

The desquamation of the skin of the scrotum appears to be an essential part of the condition produced by the diet, and this appears to be the only lesion which is not encountered in Stuttgart disease.

ENDOCARDITIS IN YOUNG CHILDREN AND LAMBS.

Dr. G. Arbour Stephens (Swansea) writes, in a recent issue of the *British Medical Journal*: "I desire to draw the attention of provincial members of the Association to a condition of the heart found in under-nourished lambs, in the hope that some of them may test my observations. In large flocks it is well known that many lambs are under-nourished because, at a time when they are unable to eat much grass, they cannot obtain a proper supply of milk from their mothers. On examining the hearts of such lambs I have found that there is an inflammatory fringe on the edge of the mitral valve and a smaller one on the tricuspid, while the heart muscle is pale and softer than normal.

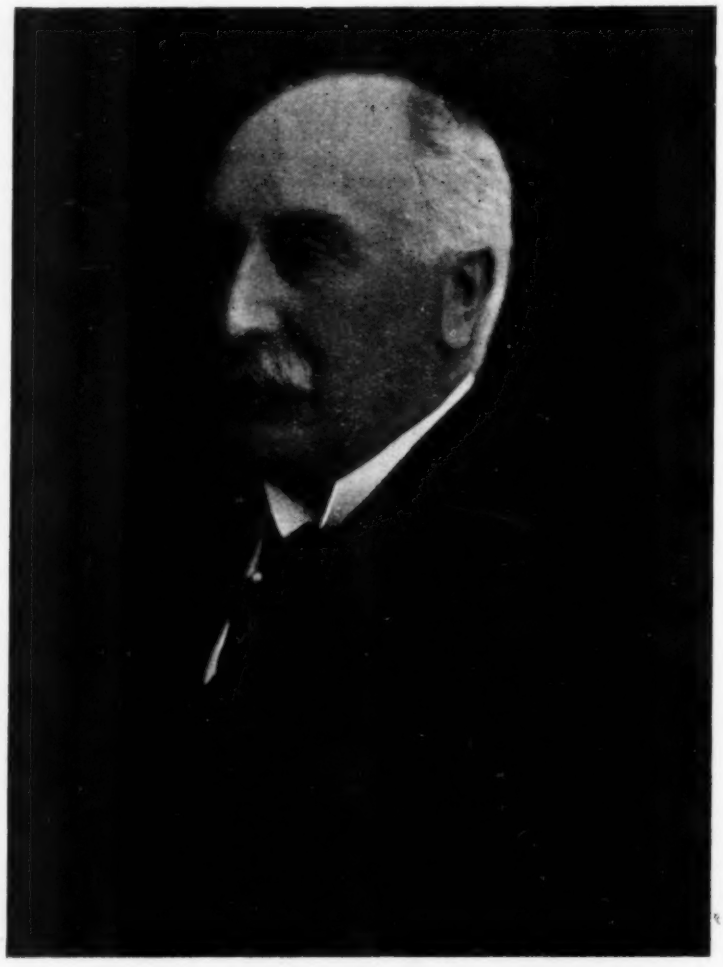
"Milk, as a lime-containing food, is necessary for the growth of bones and the development of blood, and, if the supply is reduced, both suffer. The fact which I have been trying to emphasise, namely, that heart disease occurs only in children who do not get milk (while possessing a perverted appetitite for acids such as vinegar), seems to be corroborated by my observations in connexion with lambs. In both cases the blood lacks proper nourishment, with the result that the interaction between the leucocytes and the endothelium of the blood vessels of the valves is so interfered with as to give rise to an inflammatory exudation there. To what extent the lowered vitality of the lambs under these conditions must be associated with a poison introduced by an insect or an intestinal parasite I am not certain, though I am satisfied that such has undoubtedly a marked determining influence in connexion with the development of endocarditis. This is made very evident by examination of badly nourished children who have been bitten by insects such as midges, harvest bugs, or even fleas, at the end of the summer; many of the children are ill from the bites and often show evidence of endocarditis soon after."

OBITUARY.

Professor Edgar March Crookshank.

We deeply regret to record the death, in his 70th year, of Emeritus Professor Edgar March Crookshank, M.D., the eminent bacteriologist, which occurred suddenly at his home, Ridge Hill Manor, East Grinstead, on Sunday last.

His loss will be severely felt, not only in the medical world, but also in veterinary and agricultural science, to which he devoted the later years of his life. For more than 38 years he was one of the Governors of the Royal Veterinary College, being elected by them as chairman of the General Purposes Committee and chairman of the Committee of Management of the Research Institute in Animal Pathology. At the time of his death he occupied the position of senior vice-president of the College, and he was engaged in the comprehensive scheme for the reconstruction and rebuilding of the present college in Camden Town, being the chairman of the Rebuilding and Appeal Fund Committee. "To see the Royal Veterinary College rebuilt and reconstructed on modern lines, such as to be worthy of England, was one of the dearest wishes of his life," says *The Times*. "His knowledge of the requirements of veterinary education in this country was deep and broadminded, and his energy and enthusiasm in this direction will make his place hard to fill."



EMERITUS PROFESSOR EDGAR MARCH CROOKSHANK, M.D.

(*Reproduced by courtesy of the Editor of "The Veterinary Journal."*)

Edgar March Crookshank was born in 1858, the youngest son of Captain Chichester Crookshank, 51st Regiment. His grandfather, Colonel Chichester Crookshank, was a distinguished officer who served under Wellington in the Peninsular War, and his great-grandfather, the Right Hon. Alexander Crookshank, was one of the Justices of the Common Pleas in Ireland, and at one time M.P. for Belfast. At an early age Crookshank showed a taste for scientific work. He became a pupil of Professor Ray Lankester at University College, London, and subsequently obtained a science exhibition at King's College, where he devoted himself more especially to biology and anatomy. He obtained two additional scholarships at King's College, and an exhibition and gold medal in anatomy at the University of London, where he took the degree of M.B., with honours. He studied under the late Lord Lister, and in 1882 was selected for special duty in antiseptic surgery on the staff of Sir James Hanbury, principal medical officer of the Egyptian Expedition. He was present at the battle of Tel-el-Kebir, and received the medal and the Khedive's Star for his services. He wrote a report on the antiseptic methods employed at the field and base hospitals of the expedition, and gave valuable evidence before the Royal Commission on the Medical Services in Egypt.

In 1885 Crookshank went to Berlin, where he undertook bacteriological research, and repeatedly visited the laboratories of M. Pasteur in Paris and of Dr. Koch in Berlin. In 1886 he published his first work, "A Manual of Bacteriology," which has been also published in America and translated into French. In the same year he was appointed Professor of Bacteriology in King's College, and founded there the first laboratory to be established in England for research and instruction in bacteriology and comparative pathology. In this laboratory arrangements were made whereby not only the students and practitioners of human medicine were allowed to attend his lectures, but the students of veterinary science were also made welcome. This was especially appreciated as bacteriology was then in its infancy. For many years he was a Governor of this Institution.

Crookshank's next work was "Photographs of Bacteria." He undertook researches on behalf of the Government, which were published in the annual reports of the Board of Agriculture, and in 1899 he received the thanks of the Committee of Council. For a series of exhaustive papers on "The History and Pathology of Actinomycosis" he received the thanks of the Privy Council. He was elected a Fellow of King's College, and in 1889 was made Emeritus Professor, and became a Governor and active member of the Royal Agricultural Society. In the same year he published two large volumes on "The History and Pathology of Vaccination." This was followed by evidence on the subject before the Royal Commission on Vaccination. In 1894, he was appointed J.P. for Sussex, and in 1906 he unsuccessfully contested the East Grinstead Division as a Unionist and Tariff Reformer. He travelled extensively in the Dominions, and was deputy-chairman of the Scottish Australian Investment Company and the Scottish Australian Mining Company. He was a skilled hunter of big game, and at his home at East Grinstead were many heads which had fallen to his gun in South Africa and elsewhere.

MR. ROBERT BARRATT LITTLER, M.R.C.V.S.

"It will come as a great shock to his many friends and to the townspeople generally to learn of the somewhat

sudden death of Mr. Robert Barratt Littler, M.R.C.V.S., of Appletongate, Newark," says the *Newark Herald*, of June 23rd. "Mr. Littler was in his fiftieth year and represented the fourth generation of his family as veterinary surgeons. Pursuing his business as usual on Monday he had suddenly to take to his bed, stricken with acute appendicitis. An operation was hurriedly decided upon on Thursday evening, and although this was successfully performed at the Newark Hospital, complications set in and Mr. Littler passed away at 7 o'clock yesterday morning.

"A son of Mr. and Mrs. Samuel Littler, of Appletongate, Mr. Littler was born in Middlegate in 1878. He was educated primarily by the Rev. T. C. Ewbank, at Hatton House, Newark, and went on to Nottingham University College, winning the Notts. County Council Scholarship for 1894. From Nottingham he went to Dick's Royal College, Edinburgh, graduating as a graduate of the Highland Agricultural Society of Scotland at the early age of 21. He gained marked success at this College; he was medallist for anatomy, zoology and practical chemistry; gold medallist for chemistry and silver medallist for botany, 1896-97; gold medal for senior anatomy, bronze medal histology, gold medal for physiology, 1897-98; gold medal for pathology, silver medal for hygiene and for materia medica, 1898-99; silver medal clinic, gold medal veterinary science and bronze medal obstetrics, 1900; winner of the McFarlane silver medal for best aggregate of marks in whole examination and silver medallist for best essay on "Prophylaxis," and for a communication read before the Students' Association. He was also the winner of the £20 Bursary.

"On leaving College he devoted himself to research work and was later a Professor of Veterinary Surgery at Hollesley Bay Agricultural College. He refused a professor's chair at the Edinburgh Veterinary College and took several post-graduate courses in London.

"Twenty years ago he came as an assistant to his father and in his career had achieved some very remarkable cures. He was Inspector for Contagious Diseases for the Borough of Newark and the Newark Division of the County of Nottingham, and among his hobbies were shooting, photography and rowing. As a youth he was an enthusiastic member of the Newark Rowing Club."

THOMPSON, Mr. Frederick, 42 Northumberland Street, Morecambe. Graduated, 21st December, 1888, London. Died, 30th May, 1928.

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

July 7th—Meeting of the Dumfries and Galloway Division at the Crown and Mitre Hotel, Carlisle, 1-30 p.m.

July 10th—R.C.V.S. Written Examinations.

July 12th—R.C.V.S. Oral Examinations begin in London.

Meeting of the Central Division at Messrs. Armour & Co.'s Laboratory, Bermondsey, 3 p.m.

July 16th—Meeting of the Editorial Committee, N.V.M.A., 4-30 p.m.

July 20th—Meeting of the Mid-West and South Wales Division, N.V.M.A., at the Laboratories of the Ministry of Agriculture, Weybridge.

Meeting of the Lancashire Division at Blossoms' Hotel, Chester, at 3 p.m.

July 27th—Meeting of the Eastern Counties Division, N.V.M.A., at Bury St. Edmunds.

Royal College of Veterinary Surgeons.

D.V.S.M. EXAMINATION.

At the Examinations recently held in Dublin and Edinburgh, for the Diploma in Veterinary State Medicine, the following candidates have been declared successful:—

Dublin: J. J. O'Donovan, J. M. Murphy, T. J. Hurley and P. A. Rogan.

Edinburgh: A. J. Baxter, D. D. Canning, G. Johnson, A. B. Kerr, R. S. Kyle, J. J. Magowan, R. Moore, J. H. Motion, W. Scott, C. V. Watkins and J. S. Watt.

FRED BULLOCK,
Secretary.

ARGENTINA AND FOOT-AND-MOUTH DISEASE.

"A correspondent calls attention to the step taken by the Argentine Ministry of Agriculture in appointing Mr. S. H. Gaiger, Director of the Department of Veterinary Pathology of the University of Liverpool, to advise and assist the Argentine Government in its campaign against foot-and-mouth disease," writes the agricultural correspondent of *The Times* in a recent issue of that paper. "He thinks this action has received less prominence than it deserves, but the selection of Mr. Gaiger for this work was known and published some time ago. In conjunction with other evidences of a wish to improve matters in the export trade in meat from South America, the appointment of a British veterinary authority to collaborate in the task of checking the passing of contaminated animals into the 'frigorificos' was welcomed here. The improved efforts designed to prevent the disease from reaching this country through shipments of chilled or frozen meat will not be under-estimated in this country. Nevertheless, the point has not yet been reached when the British Government can safely relax any of the measures devised to safeguard our herds and flocks against the risk of infection."

IN PARLIAMENT.

Damage to Poultry by Dogs. In the House of Lords on June 28th, the Earl of Cranbrook moved the second reading of the Dogs Act (Amendment) Bill, which had passed the Commons. The measure extended the liability of the owner of a dog which did injury to cattle, to the owner of a dog which did injury to poultry. In view of the great increase in poultry farming, it was desirable that the legal position of the owner of a dog which killed poultry should be the same as that of the owner of a dog which killed cattle. The Bill also dealt with the delivery of stray dogs to the police, and extended the section of the principal Act providing that an owner of cattle should not leave the carcases of dead cattle unburied in a place to which dogs could have access to a person having control of the cattle.

The Earl of Stradbroke, Parliamentary Secretary to the Ministry of Agriculture, said that the Government approved of the Bill, which would do away with anomalies in the present law.

Lord Parmoor said that the Bill would remove certain difficulties which had been met in farming districts.

Viscount Bertie, of Thame, pointed out that whereas, under the principal Act, no dogs could be sold for vivisection, found dogs, under the Bill, were not so protected. In Committee he would move an amendment to bring the Bill into line with the present law in that respect.

The Bill was read a second time.

Slaughter of Animals (Scotland) Bill. The House of Commons, on June 22nd, considered the Slaughter of

Animals (Scotland) Bill, and passed it through report and third reading. The bill proposes to make the use of the humane killer compulsory for the slaughter in Scotland of cattle, calves, sheep, and lambs, but not of swine. An amendment to allow young lambs and calves to be killed by the knife was defeated. General Charteris referred to an experiment conducted by the chief veterinary officer of Edinburgh, and attended by two independent scientists of Edinburgh. This experiment had determined that from the time when the first incision of the skin was made by the bullet from the captive bolt of the instrument there elapsed no more than four-fifths of a second until complete unconsciousness supervened. With the knife the time was thirty-three and one-fifth seconds. With the humane killer unconsciousness was, for all intents and purposes, instantaneous.

Dr. Drummond Shiels said that sheep required the use of the humane killer more than any other animal.

Dr. Elliot (Under-Secretary for Scotland) said the Government regarded the bill as an instalment of legislation applicable to the United Kingdom.

CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents

"The Inadequacy of our Recognition and Protection as a Profession."

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—The paper by Professor Hobday, published in your edition of April 14th, and the ensuing discussion will, I am sure, be read with great interest by those in the profession in all parts of the Empire. That the position of veterinarians in the scientific world, as well as their prestige in the social world, has not been, and is not, all that could be desired, is beyond argument. The blame for this state of affairs cannot be laid entirely upon those outside the profession. Some of our members have been judged by the standards which they have themselves set, and have earned, and rightly so, a position which would not be tolerated by others. Nevertheless, the behaviour of the few has reacted to the detriment of the majority. The question which is so obviously agitating the minds of many is the nature of the remedy. May I suggest that a paragraph in one of the letters quoted by Professor Hobday indicates the remedy? It is as follows:—

> "The work done in Africa . . . has done more to raise the status of the profession than any other method could have done in a century."

I am sure that a considerable number of thinking veterinary surgeons will agree that the only basis upon which any profession can stand in the scientific world is one resulting from adequate work carried out in a competent manner. Professor Hobday says: "We do not put forward our claims in a loud enough voice."

This statement is, of course, open to misinterpretation, and I hope I am not doing the professor an injustice when I submit that the blowing of one's own trumpet is often followed by results other than those desired. If our work, and its results, are of the right quality, other voices will be raised on our behalf. Recognition has been long in coming, but signs are not wanting that improvement is very nigh. Those of us who had the privilege of attending the recent Imperial Agricultural Research Conference came away with a sure conviction that we are on the eve of a better and brighter day for the profession. In the report of that Conference (pp. 130-131) will be found the following words, spoken by the Right Hon. W. G. A. Ormsby Gore, Under-Secretary of State for the Colonies:—

> "Some of us do feel that, until quite recently, Veterinary Science . . . has suffered from lack of recognition and assistance."

That the lack of recognition referred to is not merely made the subject of a pious remark is proved by the fact that, before it was uttered, a Committee, presided over by Lord Lovat, had been appointed to enquire into conditions in the Colonial Veterinary Service.

Does it not appear, Sir, that others are commencing to recognise, and put forward, our claims? What is our part? We can see to it, as individuals, and as a profession, that none of the increased confidence and recognition is misplaced. If we have done well in the past we must do better in the future. The opportunities are ample.

As regards the social position. This will always, and for this let us be thankful, be governed by the individual. No person can ever obtain a standing in desirable social circles unless he merits it by his behaviour.

There seems to be an impression that the status of the profession, in most of our Colonies, is low. The writer's experience of our Colonies is limited, but he asserts that such a feeling, in respect of Africa, is unjustified. The heads of the Veterinary Departments in at least two of our African Colonies, are members of the Legislative Council, and in others the Chief Veterinary Officer is responsible to the Governor alone. There has recently been a revision of salaries in some of the East African group as a result of which the pay of Veterinary Officers has materially increased. It is quite possible that the report of the "Lovat" Committee will be published before this letter reaches England. It is confidently anticipated, from references made in the report of the Committee on the Colonial Agricultural Service, that recommendations will be made which will place the veterinary profession in a much better position in all our Colonies.

It must be our fervent wish that those candidates who offer themselves for future vacancies will be so equipped as to enable them to earn a still greater recognition. Reference was made, in a letter quoted by Professor Hobday, to a statement made by a certain Director of Agriculture who asserted that the qualification of the Royal College was insufficient for the Colonial research worker. If the word "training" be substituted for "qualification" the writer is quite in agreement with the statement. From personal experience, emphasised by officers with whom he has served, he knows too well the inadequacy of any training obtained entirely in the United Kingdom. That training could, however, be so modified as to give a more adequate foundation. Every Colonial Veterinary Officer is a research worker, even though he spends the whole of his time in the field. The diagnosis of disease in, and the treatment of, individual animals, is of rare occurrence. His work is continually upon a much wider scale—he is continually meeting the unknown. Many times, when perhaps some hundreds of miles from a laboratory or a professional colleague, he meets with a disease or diseases which he must diagnose himself, and he must also institute measures which may have a far-reaching effect upon trade and native customs, and interfere, to a considerable extent, with the immediate economic condition of a large district. In many districts he has dealings with natives only. In such cases, it is of great importance that he is a man who will maintain the traditions and prestige of the European.

Tropical diseases receive, at present, too little consideration in the curriculum of the veterinary student. Special provision should be made at college for those men who desire to take up work in our Colonies and a post-graduate course, designed to fit him for his work, instituted at once. The present post-graduate courses, which carry with them a diploma, have been based too largely upon home requirements.

In the Colonies, the Veterinary Officer has to fulfil many functions; his work is not limited to pathological conditions in animals. He is adviser upon all branches of animal husbandry, genetics, and nutrition. Can it be safely said that our present veterinary education fits a man for such work? Have we not been inclined to say we are the people to do all these things without properly equipping ourselves for the task? Our professional education is the best possible groundwork for work in connection with genetics and nutrition, yet we have allowed others to carry out this work. The others have not pushed themselves into

this work, as some maintain; we have allowed them to obtain recognition simply because we refused to continue our studies for specialist work. We have looked upon the Diploma of the Royal College as the *Omega*, instead of the *Alpha*, of our education. If the work of Veterinary Officers in our Colonies is to be confined to the control and eradication of disease they will, in the future, occupy a limited place in the history of progress. If, on the other hand, they fit themselves for the guidance of all branches of the animal industry, they will become of the greatest economic importance.

In the speech from which a quotation has already been given, Mr. Ormsby Gore said:—

> "I use the word veterinary in what I regard as its only proper sense, that is, as including animal husbandry, animal nutrition, and animal genetics, and not merely the pathology of domestic animals."

Let us see to it that we who have hitherto borne the title of "veterinarians" continue to fill all the rôles in the definition given.

The writer is of the opinion that, in another way, our graduates have been handicapped. We have been too insular and isolated. Although some of our colleges are now affiliated with universities, it is not sufficient. They ought to become intra-, and not extra-, mural institutions. We ought to give our students the benefit of that wider education which comes from intimate contact with others. The writer is not a graduate of the London College, and therefore, cannot be expected to look upon it in the same light as those to whom the appeal for their *Alma mater* is now being made. He does, however, view with concern the erection of a building, in the isolation of the north-west quarter of London, for the education of future veterinarians. There is not the necessary accommodation for teaching, other than theoretically, those principles of animal husbandry which are so essential. Would it not have been far better to remove to, say, Cambridge, where so much work in which we are vitally interested is being carried on?

At present, there are few who are in a position to appreciate, at its true value, the work which is being performed by Veterinary Officers in our Colonies. That work is, however, becoming more and more recognised as a necessity in agricultural advancement. It is for those who control the profession at home to do their share. Find the right men, train them properly, and the further advancement of the profession will automatically follow.—I am, Sir, yours faithfully, J. SMITH, Chief Veterinary Officer, Northern Rhodesia.

Livingstone,
Northern Rhodesia.
8th June, 1928.

The Royal Veterinary College.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—Having discussed the rebuilding of the Royal Veterinary College with many members of the profession, I have found quite a number to agree with me that the new college should not be built at Camden Town, but in the country. We have never heard any convincing reasons for keeping the college in Camden Town, and beg to enumerate our reasons for advocating a different site.

1. Health of professors, students, etc. The present necessity of sending our students to the slums of London to live in dingy lodgings is most undesirable from a physical and mental point of view.

2. Expense. The value of the present site must be very great, that of a country site correspondingly cheaper; therefore, our scheme would help the financial problem. Within 20-100 miles of London old mansions with farms attached are frequently sold very cheaply. A place like this could be converted into an ideal veterinary college.

3. Better facilities for education. A country college could have a model dairy, brood mares, sheep and pigs, poultry, a small farm to produce crops, etc., etc.

All these items could be easily arranged for and could be made nearly, if not quite, self-supporting. The question as to how students can best attain more so-called "practical experience" is an old one. It has always been recognised that our training college must provide better facilities for it, or a system of apprenticeship be adopted. The country college would help matters a great deal, although at least six months' apprenticeship with a suitable practitioner would be advantageously added.

It is impossible to turn out a graduate in truth "qualified to practice the art and science of Veterinary Surgery and Medicine." But we should be able to get nearer to this ideal than we do at present.

It is obviously impossible for a student to acquire at Camden Town knowledge which he is expected to possess at his examinations. A large proportion of our cases are related to the breeding of farm stock—parturition, retained membranes, navel infections, castration, milk fever, mastitis, etc., etc. Is it correct for a veterinary school to allow a student to acquire knowledge on these subjects as best he may in his college vacations? In my time there was not even a list of practitioners who would be willing to take students.

There would possibly be a difficulty in finding enough suitable men who were willing "to teach the young idea how to shoot"; but the question is well worth reconsidering.

A hostel should certainly be run in connection with the college. It seems incongruous for students of hygiene to live themselves in the poorly-equipped "diggings" adjacent to the *Alma mater*.

Will all who are in favour of a country college come forward at once before the rebuilding commences?

In conclusion, does it not seem appropriate in every way to have a training centre, the *raison d' être* of which is the domestic animal, situated rurally amongst the animals it professes to study?—Yours faithfully, J. M. ARMFIELD, (*ex* R.V.C.).

Garth Steading,
Chipstead,
Surrey.
29th June, 1928.

William Harvey.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I read with interest the late Isaac Seaman's note referring to Dr. Harvey's tomb, reproduced on page 493 of the *Veterinary Record* of June 16th. I showed it to the Vicar of Hempstead and enclosed is a letter from him. I have seen myself the visor worn by Dr. Harvey which he wore at the Battle of Edgehill, still hanging in the Church.—Yours faithfully, PERCY WELCH.

Our correspondent's enclosure is as follows:—

Great Sampford with Hempstead Vicarage,
Saffron Walden, Essex.
June 18th, 1928.

Dear Mr. Welch,—I am deeply grateful for your kind thought in sending for my perusal the copy of *The Veterinary Record*, which I have read with great interest and pleasure, and I now return the same with my compliments and thanks.

I did not know that the Veterinary Association had not been invited to join in the Tercentenary Celebrations of Harvey. They ought to have been, for the Harvey epitaph in Hempstead Church records the work that Harvey had done and the services rendered in the cause of the rise and generation of animals as well as of human kind.—With kind regards, yours very faithfully, T. P. CONYERS BARKER.

"The Priory,"
Saffron Walden,
June 19th, 1928.

The Editor acknowledges the receipt of the following:—

Communications from Messrs. R. W. Lewis and W. D. Rees.

Report of a meeting of the Lancashire Division N.V.M.A. from Mr. J. Spruell, Hon. Secretary.

HEMO-RATION Blood-making DOG FOOD.
The Dog Food Supreme.

FOR breeding animals of both sexes, or anæmic or convalescent animals, there is no food so valuable as **Hemo-Ration.**
It carries a large percentage of Cod Liver Oil, fresh blood and is rich in organic iron and calcium phosphate.
Hemo-Ration is a meat food, properly combined with essential materials to render it perfect for this particular use.
Try it and secure wonderful results.
We also prepare **Ken-L-Ration** the complete dog food.
Pup-E Ration for little fellows, and
Mare-Meat, the concentrated basic food for combining with other foods for large users.
Sample sent on request without charge to the veterinary profession.

CHAPPEL BROS. LTD.,
(Dept. B.) 28 VICTORIA ST., LONDON, S.W.1

These foods are obtainable at leading stores everywhere.

"CASH"

CAPTIVE BOLT PISTOL.

THE MECHANICAL POLE-AXE.
NO BULLET USED.

CARTRIDGES SUPPLIED FOR EITHER SMALL ANIMALS OR HORNED CATTLE.

ACCLES & SHELVOKE Ltd.,
ASTON, BIRMINGHAM.

'WELLCOME' BRAND
SWINE ERYSIPELAS SERUM AND VACCINE

The Serum is recommended in the treatment of infected pigs and for use on pigs in infected premises.

The use of the Vaccine gives rise to an active immunity, and should be used on healthy pigs in non-infected premises.

'WELLCOME' BRAND SWINE ERYSIPELAS SERUM
Rubber-stoppered bottles, 10 c.c. and 100 c.c.

'WELLCOME' BRAND SWINE ERYSIPELAS VACCINE
Hermetically-sealed phials of 5 c.c. and 25 c.c.

Full particulars on request

Prepared at the
WELLCOME PHYSIOLOGICAL RESEARCH LABORATORIES
LANGLEY COURT
BECKENHAM, KENT

Supplied by

BURROUGHS WELLCOME & CO.
SNOW HILL BUILDINGS
LONDON, E.C. 1

V 153 COPYRIGHT

Journal of the American Veterinary Medical Association,

formerly

AMERICAN VETERINARY REVIEW
(Original Official Organ U.S. Vet. Med. Assn.).
Established 1877.

Edited and Published for the

American Veterinary Medical Association
(H. PRESTON HOSKINS, *Secretary-Editor*),

716 Book Building, Detroit, Mich., U.S.A.

Price £1 1s. 0d. per annum,
POST FREE.

Subscriptions to N.V.M.A., 10 Gray's Inn Square, W.C.1., or direct to the publishers.